REMARKS

Claims 85-96 are pending in the present application. Claims 85, 88 and 91-93 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,738,574 to Tolles et al. ("the Tolles patent") in view of U.S. Patent No. 6,149,512 to Wilson et al. ("the Wilson patent"). Claims 85 and 89 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Wilson patent in view of the Tolles patent. Claims 86 and 87 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Tolles patent in view of the Wilson patent, and further in view of U.S. Patent No. 6,093,080 to Inaba et al. ("the Inaba patent"). Claim 90 was rejected under 35 U.S.C. 103(a) as being unpatentable over the Wilson patent in view of the Tolles patent and further in view of U.S. Patent No. 6,135,859 to Tietz ("the Tietz patent").

The disclosed embodiments of the invention will now be discussed in comparison to the prior art. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the prior art subject matter, do not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claims distinctions discussed thereafter.

The various embodiments of the invention are directed to methods and apparatuses for conditioning and monitoring a planarizing medium used for planarizing a microelectronic substrate. In one embodiment, the apparatus includes a conditioning body coupled to a support member for supporting the conditioning body on the planarizing pad. The conditioning body includes a conditioning surface that is configured to engage a planarizing surface of the planarization medium. In a particular embodiment, the conditioning body may have a circular planform shape that may be used on a planarizing medium having a circular planform shape, or an elongated shape, when the planarizing medium extends between a supply roller and a take up roller. Alternately, the conditioning body may be elongated across a width of the planarizing medium. In either embodiment, at least one of the conditioning body and the planarization medium is movable relative to the other when the planarizing medium is undergoing conditioning. The disclosed apparatus further includes a force sensor for detecting a frictional force imparted to the conditioning body by the planarizing medium when at least one of the conditioning body and the planarizing medium is moved relative to the other.

In operation, the support member is displaced responsive to the movement of the conditioning body and the continuous planarizing relative to each other. The displacement of the support member transmits a force to a force sensor that corresponds to the frictional force. For example, in one particular embodiment, the support may include two supports that are pivotable relative to one another, and the sensor may include a force sensor positioned between the two members to detect a force applied by one support member on the other support member as the conditioning body engages the planarization medium. In another embodiment, the support member may include a piston that is movably received in a cylinder, and the sensor includes a pressure transducer that is configured to sense pressure changes in the cylinder as the piston is displaced.

The examiner has cited the Tolles patent. The Tolles patent discloses an apparatus for polishing semiconductor wafers. The apparatus includes a conditioner head. As the surface of the polishing pad rotates under the conditioning head, the coefficient of friction between the polishing pad and the conditioner head varies due to the varied surface condition of the polishing pad. For example, a glazed region of the polishing pad provides a lower coefficient of friction between surfaces than a non-glazed region. When the friction between the conditioner head and the polishing pad increases, the torque necessary to turn the conditioner head at a constant velocity increases. Conversely, when the friction between the conditioner head and the polishing pad decreases, the torque necessary to turn the conditioner head at a contact velocity decreases. Thus, the Tolles patent appears to detect a frictional force between the polishing pad and the conditioner head by the current required to maintain the rotation of the conditioner head at a constant velocity. The frictional force is not detected by a support member of the conditioner head moving responsive to the frictional forces and the moving of the support member transmitting a force corresponding to the frictional force to a force sensor.

The examiner has also cited the Wilson, Inaba, and Tietz patents all of which do not remedy the above deficiencies of the Tolles patent.

Turning now to the claims, the patentably distinct differences between the cited references and the claim language will be specifically pointed out. Claim 85 recites, in part, "[a] method for controlling conditioning of a continuous planarizing medium used for planarizing a

microelectronic substrate, the method comprising: positioning the continuous planarizing pad around a pair of spaced apart rollers to define a first planarization station and an opposing second planarization station; engaging a conditioning body with the continuous planarizing pad proximate to at least one of the first planarization station and the opposing second planarization station and moving at least one of the conditioning body and the continuous planarizing medium relative to the other while the conditioning body contacts the continuous planarizing medium, *wherein the conditioning body is coupled to a first support member for supporting the conditioning body on the planarizing pad*; detecting a frictional force between the conditioning body and the continuous planarizing medium *by the first support member moving responsive to the frictional force, the moving of the first support member transmitting a force to a force sensor*; and controlling at least one of a force between the conditioning body and the continuous planarizing medium and a speed of the conditioning body relative to the continuous planarizing medium in response to detecting the frictional force between the conditioning body and the planarizing medium. (Emphasis Added). None of the cited references discloses or fairly suggest the above limitations.

In particular, none of the cited references discloses or fairly suggests a method of detecting a frictional force between a conditioning body and a continuous planarizing medium including the acts of detecting a frictional force between the conditioning body and the continuous planarizing medium by the first support member moving responsive to the frictional force, the moving of the first support member transmitting a force to a force sensor. In fact, the Tolles patent teaches away from such a method by detecting a frictional force by, presumably, a change in electrical current required to rotate the conditioning body. Claims depending from claim 85 are also allowable due to depending from an allowable base claim and further in view of the additional limitations recited in the dependent claims.

All of the claims remaining in the application (claims 84-96) are now clearly allowable. Favorable consideration and a timely Notice of Allowance are earnestly solicited.

Respectfully submitted,

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